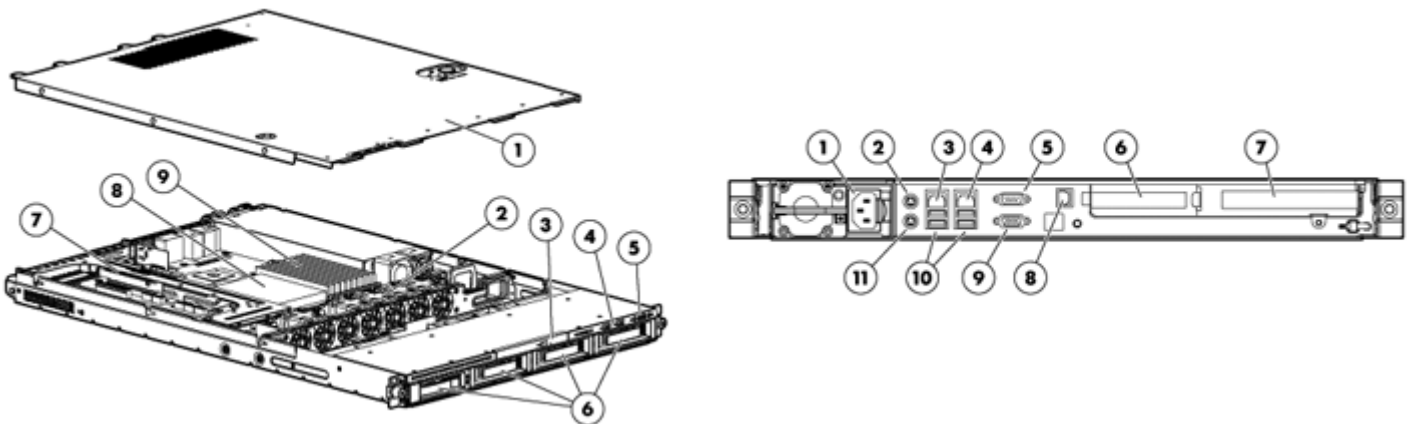


Overview

The HP ProLiant DL320 G6 Server is an enterprise rack-optimized server at an entry level price. The highly manageable 1 processor, 1U server is ideal for single-application IT infrastructure, web and edge-of-network applications.

The HP infrastructure management capabilities, combined with other Insight software, give the DL320 G6 enterprise-class management features. Support for 1 to 4 low-cost Serial ATA drives on an integrated RAID0/1/10 controller, with an optional upgrade to highly reliable hot plug SAS hard drives, gives the DL320 G6 flexibility to meet the needs of your datacenter. Plus, you get the cost-effective solution of a single-processor platform with options from the Intel® Xeon® Processor 5500 and 5600 sequences with turbo mode.



Front View:

1. Cover
2. Non Hot Plug Dual Rotor Fans
3. Optional Slim 9.5mm DVD ROM
4. USB connectors (2)
5. Power Button, UID button, and Front LED Indicators
6. Support for up to four SATA or SAS Hard Drives or SSD's
7. Two PCI-Express Slots (2 PCI-Express 2.0 x16 connectors standard)
8. Processor Socket (Intel Xeon, Core 2, Quad Core, and Six Core)
9. Nine DDR3 Memory Slots

Rear View:

1. Power supply
2. Mouse connector
3. NIC 1 Port/Shared iLO 2 Management Port
4. NIC 2 Port
5. Serial connector
6. PCI Express expansion slot 5, low-profile, half-length
7. PCI Express expansion slot 4, (optional PCI-X, full-length)
8. Dedicated Integrated Lights-Out 2 (ProLiant Onboard Administrator powered by integrated Lights-Out 2) management port (optional)
9. Video connector
10. USB connectors (4)
11. Keyboard connector

What's New

- Support for new HP hard drive



Standard Features

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

Processor

One of the following depending on Model

Six-Core Processors

Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor

Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) Processor

Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor

Quad-Core Processors

Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) Processor

Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) Processor

Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor

Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) Processor

Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W, DDR3 1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® L5506 (2.13GHz/4-core/4MB/60W, DDR3-800) Processor

Intel® Xeon® L5609 (1.86GHz/4-core/12MB/40W, DDR3-1066) Processor

Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Dual-Core Processors

Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W, DDR3-800) Processor

Intel® Xeon® E5503 (2.00GHz/2-core/4MB/80W, DDR3-800) Processor

NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology.

NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 6, 4, 3, 2, and 1 cores active.

NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

NOTE: For the Intel 5500 and 5600 Series, the letter preceding the model number indicates the performance/wattage of the processor. ; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

Cache Memory

One of the following depending on Model

4MB (1 x 4MB) Level 3 Cache

8MB (1 x 8MB) Level 3 Cache

12MB (1 x 12MB) Level 3 Cache

Chipset

Intel 5500 Chipset with up to 6.4GT/s QPI

NOTE: For more information regarding Intel chipsets, please see the following URL:
<http://www.intel.com/products/server/chipsets/>.



Standard Features

Memory Protection

Advanced ECC
Mirroring mode
Lock-step mode
Online spare

NOTE: Xeon W3500 processor family does not support any of above advanced features.

NOTE: Online spare is only supported on Xeon 5600 processor series.

Memory

One of the following depending on Model

Type	DDR3 1067/1333 Registered (RDIMM) and Unbuffered (UDIMM)
Standard (Entry Models)	4 GB (2 x 2 GB) RDIMM
Standard (High Efficiency Models)	4 GB (2 x 2 GB) UDIMM
Standard (Performance Models)	6 GB (3 x 2 GB) RDIMM
Maximum Memory	Up to 192 GB, using DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 2 DIMMs per Channel in 6 Slots. Up to 24 GB, using DDR3 Unbuffered (UDIMM) memory, operating at 1066MHz when fully populated at 2 DIMMs per Channel in 6 slots.

Network Controller

Embedded NC326i Dual Port Gigabit Server Adapter

Expansion Slots

NOTE: Two total slots. (1) Full length PCI Express x16 slot (x16 connector). Can be replaced with a full-length 64-bit /133MHz PCI-X slot. (1) Half-length, low-profile PCI Express x4 slot (x16 connector).

Expansion Slots #	Technology	Bus Width**	Connector Width	Bus Number*	Form Factor	Notes
5 (Standard)	PCIe	x4	x16	10	Low profile (half length, half height) slot	
4 (Standard)	PCIe	x16	x16	21	Full length, full height slot	This PCIe slot can be replaced with optional PCI-X slot below
4 (Optional)	PCI-X (133MHz, 3.3Volt)	64-bit	Not applicable	24	Full length, full height slot	

* Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number

** Indicates the number of physical electrical lanes running to the connector.



Standard Features

Storage Controllers One of the following depending on Model

Entry Models	HP Smart Array B110i SATA RAID Controller (RAID 0/1/1+0) NOTE: Transfer rate: 3Gb/s SATA NOTE: SATA Hot Plug available via Hot Plug Advance Pack for B110i NOTE: Hot Plug SAS and SATA controllers available via PCI card option.
High Efficiency Models	HP Smart Array B110i SATA RAID Controller (RAID 0/1/1+0) NOTE: Transfer rate: 3Gb/s SATA NOTE: SATA Hot Plug available via Hot Plug Advance Pack for B110i NOTE: Hot Plug SAS and SATA controllers available via PCI card option.
Performance Models	HP Smart Array P410/256MB Controller (RAID 0/1/1+0/5/5+0) NOTE: Available upgrades: Battery Kit upgrade (for BBWC), 512MB with BBWC, Flash Backed Write Cache (FBWC), and Smart Array Advanced Pack (SAAP)

Internal Storage Devices

Diskette Drive	None
Optical Drive	None ship standard Optional: Optional DVD or DVD-RW drive
Hard Drives	None ship standard
Hard Drive Bays	Standard four 3.5" (Large Form Factor) hot-plug SATA or SAS hard drive bays; optional eight 2.5" (Small Form Factor) hot-plug SATA, SAS or SSD hard drive bays

Maximum Internal Storage

LFF SATA (4HDD models - 12TB requires optional 4HDD cage)	4 x 3TB
LFF SAS (4HDD models - 12TB requires optional PCI controller)	4 x 3TB
SFF SATA, SAS, (8HDD models - requires option PCI controller)	8TB 8 x 1TB
LFF SATA SSD	3.2TB 8 x 400GB
SFF SATA SSD	3.2TB 8 x 400GB



Standard Features

Interfaces	Serial	1
	Video	1
	Network RJ-45	2
	Keyboard	1
	Pointing Device (Mouse)	1
	SD Slot	1
	USB 2.0	7 (2 front, 1 internal (optional), 4 rear)
NOTE: Please see the following URL for additional information regarding USB support. In order to connect a USB device internally, the internal USB Cable G6 Kit must be used (536769-B21). http://h18004.www1.hp.com/products/servers/platforms/usb-support.html NOTE: In order to connect a USB device internally, the internal USB Cable G6 Kit must be used (536769-B21).		

Industry Standard Compliance	ACPI 2.0 Compliant
	PCI 3.0 Compliant
	PXE Support
	WOL Support
	Microsoft® Logo certifications
	USB 2.0 Support
IPMI 2.0	

Server Power Cords	North America	One 6' Highline (IEC-IEC) power cord ships standard
	Japan	One 6' Highline (IEC) power cord and one 6' Lowline power cord ship standard
	ROW	One 6' Highline (IEC) power cord ships standard
NOTE: HP ProLiant DL320 G6 servers ship standard worldwide with a C13 to C14 2M Highline jumper cord. Japanese models also include a 2M Lowline power cord. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix		

Power Supplies	Entry Models	HP 400W Factory Integrated Power Supply, non-redundant
	High Efficiency Models	HP 500W Factory Integrated Power Supply Kit with Backplane, non-redundant
	Performance Models	HP 365W Hot Plug Redundant Power Supply Kit with Backplane, redundant

System Fans	5 dual rotor fans ship standard
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Required Cabling	For required cabling information, refer to the Web site at: www.hp.com/servers/proliantdl320-g6 .
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Standard Features

Operating Systems and Virtualization Software Support for ProLiant Servers

Microsoft Windows Server
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
Oracle Solaris

NOTE: Support differences will exist between the SATA and SAS configurations.

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server including how to purchase from HP, please visit our OS Support Site at: www.hp.com/go/ossupport and our driver download site www.hp.com/support/DL320G6.

Graphics

Integrated ATI ES1000, 64 MB video standard

- 16 bit color: maximum resolution of 1600 x 1200
- 32 bit color: maximum resolution of 1280 x 1024

NOTE: Maximum resolution available via iLO 2 remote console is 1280 x 1024.

Form Factor

Rack (1U), (1.70 in/4.32 cm), 26.85" deep

HP Insight management software

HP Insight Foundation suite

Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters.

HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation.

The foundation pack includes:

- HP SmartStart
- HP Management DVD
- HP ProLiant Smart Update Firmware DVD

SmartStart version supported (minimum): SmartStart 8.20
<http://www.hp.com/servers/smartstart>

NOTE: In an effort to support reducing our environmental impact, the HP Insight Foundation Suite for ProLiant media will be available as a selectable option for this server at time of order of a CTO SKU. This will allow customers to order the number of media kits that best meet their needs and eliminate receiving unnecessary duplicate media.

HP Integrated Lights-Out (iLO) for ProLiant

HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant



Standard Features

platform and deliver the highest possible quality of IT service. For more information, visit: www.hp.com/go/iLO

Intelligent Manageability	Automatic Server Recovery (ASR) iLO 2 Advanced Pack (optional) HP Systems Insight Manager Integrated Management Log Drive Parameter Tracking (with Smart Array Controllers) Dynamic Sector Repairing (with Smart Array Controllers) Pre-Failure Warranty (covers processors, SAS hard drives, and memory) BIOS Serial Console Front and Rear Unit ID (UID) button/LED
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Security	Power-on password USB Port control Removable optical drive assembly (optional) Removable DVD-ROM Drive Assembly (optional) Dedicated iLO2 port (optional) Serial interface control Administrator's password
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Warranty	<p>This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and parts repair is available for three years Next Business Day, with three year on-site support from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Expanded support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.</p> <p>NOTE: Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html</p>
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Optional Features

HP Insight management software

HP Insight Control

HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console.

Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See www.hp.com/go/insightcontrol

HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: <http://www.hp.com/services/insight>.

HP Insight Dynamics for ProLiant

HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. As a powerfully integrated by design toolkit to accelerate complex technology projects and simplify daily operations that ultimately enable IT Staff personnel to dynamically keep pace with the organizations changing business requirements. It enables them to plan capacity and power continuously, balance across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location.

NOTE: For more information, visit: <http://www.hp.com/go/insightdynamics>



Optional Features

HP Factory Express Capabilities

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: <http://www.hp.com/go/factory-express>.

HP Enterprise Configurator

The HP eConfigure-Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. <http://www.hp.com/products/configurator>.



Service and Support

Service and Support

HP Technology Services for Industry Standard Servers and BladeSystem

Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

What HP ProLiant and BladeSystem Services can do for you

HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs:.

HP Technology Services meets business challenges with services offered in three packages - **Optimized Care Package, Standard Care Package, and Basic Care Package** - available for each product group. Such packaged solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support packages for servers, storage, networking and software.

Optimized Care

Optimized Care Package: Supports maintaining servers at optimum performance availability

HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner <http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

HP Installation and Startup for Insight Control Software

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers <http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

3-Year HP Critical Advantage

Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW>

Additional Services: Microsoft or Linux or VMware education courses + Facility & technology environmental assessment services + Energy Efficiency Design, Factory Express



Service and Support

Standard Care

Standard Care Package: Package that maintains high level of server availability

HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner
<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

HP Installation and Startup for Insight Control Software

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers
<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

3-Year HP 6 hour Hardware Support Onsite Call-to-Repair Service

Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center
<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf>

3-Year , HP 24x7 Software Support for Insight Control

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers
<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf>

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up, and Software Support; Install and Startup Services for Insight Control; Microsoft or Linux or VMware education courses; +30 Proactive Select Credits, Factory Express

Basic Care

Basic Care Package: delivers minimum recommended support service level

HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner
<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers
<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); +10 Proactive Select Credits, Factory Express

Insight Remote Support

The packages include HP Insight Remote Support that uses proven technology to deliver secure, reliable 24x7 remote monitoring, diagnoses, and problem resolution. It is available at no additional cost to all warranty, HP Care Pack Service, and service agreement customers.

For more information

To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: <http://www.hp.com/services/proliant>



Pre-configured Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

NOTE: Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.

NOTE: HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.

NOTE: If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.

NOTE: Not all models are available in all regions. Check with your local country HP offices for availability.

Entry Models

HP ProLiant DL320 G6 E5603 1P 4GB-R B110i SATA RAID 400W PS Server 638328-xx1	Processor(s)	(1) Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor
	Cache Memory	4MB L3 Cache
	Memory	4 GB (2 x 2 GB) DDR3 RDIMM NOTE: 9 DIMM slots.
	Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)
	Hard Drives	None ship standard
	Internal Storage	Up to 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum NOTE: SATA Hot Plug requires Hot Plug Advance Pack for B110i NOTE: SAS requires optional PCI Controller
	Optical Drive	Optional
	Power Supply	HP 400W Factory Integrated Power Supply Kit
	Fans	5 dual rotor fans ship standard
	Form Factor	Rack (1U), (1.70 in/4.32 cm)
	Warranty	Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response.

HP ProLiant DL320 G6 E5503 2.0GHz 2-core 1P 4GB-R B110i Hot Plug SATA 4 LFF 400W PS Server 593493-xx1	Processor(s)	(1) Intel® Xeon® E5503 (2.00GHz/2-core/4MB/80W, DDR3-800) Processor
	Cache Memory	4MB L3 Cache
	Memory	4GB (2x2 GB) DDR3 RDIMM NOTE: 9 DIMM slots.
	Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)
	Hard Drives	None ship standard
	Internal Storage	Up to 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum NOTE: SATA Hot Plug requires via Hot Plug Advance Pack for B110i NOTE: SAS requires optional PCI Controller
	Optical Drive	Optional
	Power Supply	HP 400W Factory Integrated Power Supply Kit
	Fans	5 dual rotor fans ship standard
	Form Factor	Rack (1U), (1.70 in/4.32 cm)



Pre-configured Models

Warranty

Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response.

High Efficiency Models

HP ProLiant DL320 G6
L5609 1P 4GB-U B110i
4 LFF 500W PS High
Efficiency Server
593498-xx1

Processor(s)

(1) Intel® Xeon® L5609 (1.86GHz/4-core/12MB/40W, DDR3-1066) Processor

Cache Memory

12MB L3 Cache

Memory

4 GB (2 x 2 GB) DDR3 UDIMM

NOTE: 9 DIMM slots.

Network Controller

Embedded NC326i Dual Port Gigabit Server Adapter

Storage Controller

HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)

Hard Drives

None ship standard

Internal Storage

Up to 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum

NOTE: SATA Hot Plug requires Hot Plug Advance Pack for B110i

NOTE: SAS requires optional PCI Controller

Optical Drive

Optional

Power Supply

HP 500W Factory Integrated Power Supply Kit with Backplane

Fans

5 dual rotor fans ship standard

Form Factor

Rack (1U), (1.70 in/4.32 cm)

Warranty

Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response.

Performance Models

HP ProLiant DL320 G6
E5630 2.53GHz 4-core
1P 6GB-R P410/256 Hot
Plug SAS 4 LFF 400W
RPS Server
593499-xx1

Processor(s)

(1) Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Cache Memory

12MB L3 Cache

Memory

6 GB (3 x 2 GB) DDR3 RDIMM

NOTE: 9 DIMM slots.

Network Controller

Embedded NC326i Dual Port Gigabit Server Adapter

Storage Controller

HP Smart Array P410/256MB Controller

Hard Drives

None Ship standard

Internal Storage

4 x 2TB 3.5" Hot plug SATA/SAS, Maximum

Optical Drive

Optional

Power Supply

HP 365W Hot Plug Redundant Power Supply Kit with Backplane

Fans

5 dual rotor fans ship standard

Form Factor

Rack (1U), (1.70 in/4.32 cm)

Warranty

Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response.



Pre-configured Models

Country Code Key	xx=00	U.S.
	xx=20	Brazil
	xx=29	Japan
	xx=37	APD
	xx=42	Europe
	xx=AA	PRC



Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.

NOTE: Configure-to-order (CTO) servers must start with a CTO Chassis.

NOTE: FIO indicates that this option is only available as a factory installable option.

Step 1: Base Configuration (choose one of the following configurable models)

HP Models	HP ProLiant DL320 G6 Configure-to-order Rack Server	505768-B21
	Includes:	
	Embedded NC326i Dual Port Gigabit Server Adapter	
	1 full length PCI Express x16 slot and 1 half length low profile PCI Express x4 slot	
	Integrated Lights-Out 2 (ProLiant Onboard Administrator powered by Integrated Lights-Out 2) embedded (shared NIC functionality standard)	
	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)	
	Rack (1U) form factor, (1.70 in/4.32 cm)	
	Fixed, mounting rails	

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

HP Processors	Six-Core Processors	
	HP DL320 G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) FIO Processor Kit	600743-L21
	HP DL320 G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	638648-L21
	HP DL320 G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	638647-L21
	Quad-Core Processors	
	HP DL320 G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	638646-L21
	HP DL320 G6 Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) FIO Processor Kit	638645-L21
	HP DL320 G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) FIO Processor Kit	638644-L21
	HP DL320 G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	600739-L21
	HP DL320 G6 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) FIO Processor Kit	600740-L21
	HP DL320 G6 Intel® Xeon® L5609 (1.86GHz/4-core/12MB/40W) FIO Processor Kit	600741-L21
	HP DL320 G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	600742-L21
	Dual-Core Processors	
	HP DL320 G6 Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W) FIO Processor Kit	600737-L21
	NOTE: Xeon E5500 DP family supports both Registered DIMMs and Unbuffered DIMMs. Xeon W3500 UP family supports only Unbuffered DIMMs.	
HP Drive Cage Options	HP 8SFF HDD Cage & Bkpln G6 FIO	515938-B21
	NOTE: This cage requires the P410 SAS array controller as a Primary Controller (See	



Configuration Information - Factory Integrated Models

Step 3 below if P/N 515938-B21 is selected).

HP 4 Hard Drive Hot Plug Backplane G6 Kit

512181-B21

NOTE: This is a LFF Backplane kit.

NOTE: SATA Hot Plug requires Hot Plug Advance Pack for B110i.

NOTE: SAS requires optional PCI Controller.

HP Power Supplies

HP 500W Factory Integrated Power Supply Kit with Backplane

537150-B21

HP 460W Common Slot Gold Hot Plug Power Supply Kit

503296-B21

NOTE: To use the HP 460W Common Slot Gold Hot Plug Power Supply with this server, you will need to purchase the 460W Power Supply FIO Enablement Kit (PN 515740-B21).

HP 400W Factory Integrated Power Supply Kit

515739-B21

HP 365W Redundant Power Supply Kit w/ Backplane

532092-B21

Power Options

HP DL320 G6 460W Power Supply Unit FIO Enablement Kit

515740-B21

NOTE: Required to purchase if you choose to use the HP 460W Common Slot Gold Hot Plug Power Supply with this server.

HP Memory

Registered DIMMs (RDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit

500656-B21

HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit

500658-B21

HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit

500660-B21

HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit

593339-B21

HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit

604504-B21

NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit

500662-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit

604506-B21

NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit

500666-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit

627812-B21

Unbuffered with ECC DIMMs (UDIMMs)

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit

500668-B21

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit

500670-B21

HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit

500672-B21



Configuration Information - Factory Integrated Models

HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit 619488-B21

NOTE: Depending on the memory configuration and processor model the memory speed may run at 1066MHz or 800MHz. See the Online Memory Configuration Tool for details: <http://www.hp.com/go/ddr3memory-configurator>.

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: PC3L is a low voltage memory

Step 3: Choose Additional Factory Integratable Options (only one of the following from each list unless otherwise noted)

HP Storage Controllers	NOTE: For additional Storage Controllers and Options see Additional Options in Step 4 below. Only FIO options are displayed in Step 3.	
	HP Smart Array P212/256 BBWC 1-ports Int/1-ports Ext PCIe x8 FIO SAS Controller	491191-B21
	HP Smart Array P410/ZM 2-ports Int PCIe x8 FIO SAS Controller	462860-B21
	NOTE: May be selected if P/N 515938-B21 selected in Step 2 above.	
	HP Smart Array P410/256 BBWC 2-ports Int PCIe x8 FIO SAS Controller	491195-B21
HP Insight Software	NOTE: May be selected if P/N 515938-B21 selected in Step 2 above.	
	HP Smart Array P411/256 BBWC 2-ports Ext PCIe x8 FIO SAS Controller	491193-B21
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	582765-B21
	HP Insight Control for Linux including 1yr 24x7 Support ML/DL Bundle 1 Server FIO License	TC203A

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below.



Core Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Memory

Registered DIMMs (RDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500656-B21

HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500658-B21

HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit 500660-B21

HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 593339-B21

HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604504-B21

NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500662-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604506-B21

NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit 500666-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit 627812-B21

Unbuffered with ECC DIMMs (UDIMMs)

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500668-B21

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500670-B21

HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500672-B21

HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit 619488-B21

NOTE: Depending on the memory configuration and processor model the memory speed may run at 1066MHz or 800MHz. See the Online Memory Configuration Tool for details: <http://www.hp.com/go/ddr3memory-configurator>.

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: PC3L is a low voltage memory

HP Optical Drives

HP 9.5mm SATA DVD-ROM Optical Drive 481045-B21

HP 9.5mm SATA DVD-RW Optical Drive 481047-B21



Core Options

HP Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	619291-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Hot Plug Enterprise 3 yr Warranty Hard Drive	627117-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21

SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21

SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	605835-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507610-B21

SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	625031-B21
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21

NOTE: SAS Hard Drives are only supported with optional SAS HBA or RAID cards.

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html
(Worldwide)

SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives

HP 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive	625609-B21
HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	507750-B21

SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives



Core Options

HP 3TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	628059-B21
HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	571230-B21
HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	458945-B21
NOTE: SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information:	
http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)	
SATA Hot Plug 2.5" Enterprise Mainstream Solid State Drives	
HP 400GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636597-B21
HP 200GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636595-B21
HP 120GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572073-B21
HP 100GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636593-B21
HP 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572071-B21
SATA Hot Plug 3.5" Midline (MDL) Solid State Drives	
HP 400GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636611-B21
HP 200GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636609-B21
HP 100GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636607-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:	
http://h18000.www1.hp.com/products/quickspecs/13415_div/13415_div.html (Worldwide)	
6G SAS Hot Plug Enterprise Performance Solid State Drives	
HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632494-B21
HP 200GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632492-B21
6G SAS Hot Plug Enterprise Mainstream Solid State Drives	
HP 800GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632506-B21
HP 400GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632504-B21
HP 200GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632502-B21



Core Options

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html
 (Worldwide)

HP Networking

Gigabit Ethernet Adapters

HP NC112T PCI Express Gigabit Server Adapter	503746-B21
HP NC360T PCI-E Dual Port Gigabit Server Adapter	412648-B21
HP NC364T PCI-E Quad Port Gigabit Server Adapter	435508-B21
HP NC365T 4-port Ethernet Server Adapter	593722-B21
HP NC373F PCI-E Multifunction 1000SX Gigabit Svr Adapter	394793-B21
HP NC373T PCI-E Multifunction Gigabit Server Adapter	394791-B21
HP NC375T PCI Express Quad Port Gigabit Server Adapter	538696-B21
HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21

10 Gigabit Ethernet Adapters

NOTE: No more than two 10GbE I/O devices are supported in a single ProLiant server.

NOTE: A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

NOTE: Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.

HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21
HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs.

HP I/O Expansion Options

HP DL320 G6 PCI-X Riser Kit	516230-B21
HP Dedicated iLO Management Port Option	514206-B21



Additional Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Insight Software	HP Insight Control	T9074BAE
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Electronic License	TC278AAE
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	452148-B22
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Tracking License	TC275A
	HP Insight Software Media Kit	436222-B21
	NOTE: Insight Software DVD media without licenses. Contains HP Systems Insight Manager, HP Insight Control, HP Insight Dynamics, HP Insight Control for Microsoft System Center, and Virtual Connect Enterprise Manager software. Uses an integrated installer to perform quick and accurate software installation and updates.	
	NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.	
	NOTE: Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.	
	NOTE: Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	
	NOTE: Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates .	
	NOTE: For additional license options please see the Insight Control QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	
	HP Insight Control for Linux	
	HP Insight Control for Linux including 1yr 24x7 Support Electronic License	TC213AAE
	HP Insight Control for Linux including 1yr 24x7 Support Single Server License	TC209A
	HP Insight Control for Linux Media Kit	TC208A
	NOTE: Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately.	
	NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button).	
	NOTE: Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.	
	NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.	
	NOTE: For additional License Kits, including electronic licensing options, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html	
	HP Integrated Lights-Out (iLO) Advanced	



Additional Options

HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License TA850AAE

HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License 512485-B21

NOTE: This license allows 1 server to be deployed and managed via HP iLO Advanced. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service

NOTE: Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

NOTE: For additional license kits, including electronic delivery options, please see the QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html

HP Insight Control server deployment

HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License T9082AAE

HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License 452151-B21

NOTE: Licenses ship without media. The Insight Control Media Kit can be ordered separately, or can be downloaded at: <http://www.hp.com/go/insightupdates>.

NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key, and is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

NOTE: For additional license kits please see the Insight Control QuickSpecs at:

http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html

HP Security - TPM

HP Trusted Platform Module Option 488069-B21

NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to:

www.hp.com/go/TPM.

NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment.

NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

HP Storage Controllers

SAS Controllers

NOTE: When using the following Smart Array Controllers the HP MS HP CA MiniSAS to MiniSAS 33" Cable Kit (P/N 496014-B21) is required.



Additional Options

Smart Array P212 Controller

HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller 462828-B21

HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller 462834-B21

Smart Array P410 Controller

HP Smart Array P410/256 2-ports Int PCIe x8 SAS Controller 462862-B21

HP Smart Array P410/512 BBWC 2-ports Int PCIe x8 SAS Controller 462864-B21

HP Smart Array P410/512 FBWC 2-ports Int PCIe x8 SAS Controller 578230-B21

HP Smart Array P410/1G FBWC 2-ports Int PCIe x8 SAS Controller 572532-B21

Smart Array P411 Controller

HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller 462830-B21

HP Smart Array P411/512 BBWC 2-ports Ext PCIe x8 SAS Controller 462832-B21

HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller 578229-B21

HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller 572531-B21

Smart Array P812 Controller

HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller 487204-B21

Optional Upgrades

HP 256MB P-series Cache Upgrade 462968-B21

NOTE: Supported on HP Smart Array P212 Controller only.

HP 512MB P-Series Battery Backed Write Cache Upgrade 462967-B21

NOTE: Supported on HP Smart Array P410 Controller and HP Smart Array P411 Controller only.

HP 650 mAh P-Series Battery 462969-B21

NOTE: To enable BBWC on the 256MB cache.

NOTE: Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.

HP 512MB Flash Backed Write Cache 534916-B21

HP 1GB Flash Backed Cache 534562-B21

HP Smart Array Hot Plug Advance Pack for B110i w/1y 24x7 Supp Physical 1 Svr LTU TC421A

NOTE: Please see the following QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html
(Smart Array P212 Controller)

http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html
(Smart Array P410 Controller)

http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html
(Smart Array P411 Controller)

SAS HBA

HP Modular Smart Array SC08e 2-ports Ext PCIe x8 SAS Host Bus Adapter 614988-B21

NOTE: This is a 2 x4 External Port HBA

NOTE: This is only approved for the HP P2000 G3 SAS Modular Smart Array.

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18004.www1.hp.com/products/quickspecs/13651_div/13651_div.html
(SC08e 6Gb HBA)

SCSI HBA



Additional Options

HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter 412911-B21

NOTE: Please see the following QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html
 (SC11Xe HBA)

Backup & Recovery Software

HP Data Protector Express

HP Basic Upgrade to Data Protector Express V5 for 1 Server E-LTU	TC333AAE
HP Data Protector Express V5.0 for 10 Servers E-LTU	TC332AAE
HP Data Protector Express V5.0 for 1 Server E-LTU	TC330AAE
HP Data Protector Express V5.0 for 3 Servers E-LTU	TC331AAE

NOTE: One of these Data Protector Express base products is required. To see available options: <http://www.hp.com/go/dataprotectorexpress>

Tape Backup

NOTE: For the complete range of tape drives, autoloaders, libraries and media see: <http://www.hp.com/go/tape>. For hardware and software compatibility of HP tape backup products see: <http://www.hp.com/go/connect>.

HP DAT 320 USB in 1U Rack-mount Kit	AP835B
HP 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
NOTE: Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation. Connection using HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.	
HP LTO-4 Ultrium 1760 SAS (1) in 1U Rack-mount Kit	EH946B
NOTE: Connection using HP Smart Array P212/Zero Memory Controller (462828-B21) recommended.	
HP LTO-5 Ultrium 3000 SAS Tape Drive in 1U Rackmount	EJ014A
NOTE: Connection using HP Smart Array P212/Zero Memory Controller (462828-B21) recommended.	
HP 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader	BL536A
NOTE: Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation. Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	
HP MSL2024 1 LTO-4 Ultrium 1760 SAS Tape Library	AK378A
HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library	BL537A
NOTE: Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	
HP MSL4048 2 LTO-4 Ultrium 1760 SAS Tape Library	AK380A
HP MSL4048 2 LTO-5 Ultrium 3000 SAS Tape Library	BL538A
NOTE: Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	



Additional Options

Disk Backup

NOTE: For the complete range of D2D Backup Systems see:

<http://www.hp.com/go/d2d>. For the complete range of RDX drives and media see:

<http://www.hp.com/go/rdx>. For hardware and software compatibility of HP disk

backup products see: <http://www.hp.com/go/connect>.

HP D2D Backup Systems with Backup Data Deduplication

HP D2D2502i Backup System

EJ001B

NOTE: 1.5TB of useable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.

HP D2D2504i Backup System

EJ002B

NOTE: 3.0TB of useable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.

HP D2D4112 Backup System

EH993B

NOTE: 9.0TB (expandable to 18.0TB) of useable network disk backup capacity. Fibre Channel SAN connected appliance. Direct server attach is not supported, requires connection via SAN fabric. See <http://www.hp.com/go/connect> for supported Fibre Channel Host Bus Adapters.

HP RDX Removable Disk Backup Systems USB

HP StorageWorks RDX320 Internal Removable Disk Backup System

AJ767A

NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 320GB of disk capacity per data cartridge.

HP StorageWorks RDX500 Internal Removable Disk Backup System

AJ934A

NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 500GB of disk capacity per data cartridge.

HP Storage Options

NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see:

<http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>

Brocade Fibre Channel HBAs

HP 81B PCIe 8Gb Fibre Channel Single Port Host Bus Adapter

AP769A

HP 82B PCIe 8Gb Fibre Channel Dual Port Host Bus Adapter

AP770A

HP 41B PCIe 4Gb Fibre Channel Single Port Host Bus Adapter

AP767A

HP 42B PCIe 4Gb Fibre Channel Dual Port Host Bus Adapter

AP768A

Emulex Fibre Channel HBAs

HP 81E 8Gb Single Port PCI-e Fibre Channel Host Bus Adapter

AJ762A

HP 82E 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter

AJ763A

HP FC2142SR 4Gb PCIe Host Bus Adapter

A8002A

HP FC2242SR 4Gb PCIe DC Host Bus Adapter

A8003A

QLogic Fibre Channel HBAs

HP 81Q PCI-e Fibre Channel Host Bus Adapter

AK344A

HP 82Q 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter

AJ764A

HP FC1142SR 4Gb PCIe Host Bus Adapter

AE311A



Additional Options

HP FC1242SR 4Gb PCIe DC Host Bus Adapter	AE312A
Converged Network Adapter	
HP CN1100E Dual Port Converged Network Adapter	BK835A
HP CN1000E Dual Port Converged Network Adapter	AW520A

HP Disk Storage Systems

Disk Enclosures

HP D2600 Disk Enclosure	AJ940A
HP D2700 Disk Enclosure	AJ941A

NOTE: Please see the QuickSpecs for additional options and configuration information at:
http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html
 (Worldwide)

HP Uninterruptible Power Systems

HP Rack-mountable UPS

HP R1500 G3 Uninterruptible Power Supply (UPS)

HP R1.5kVA G3 1U NA Uninterruptible Power System	AF469A
HP R1.5kVA G3 1U JP/TW Uninterruptible Power System	AF470A
HP R1.5kVA G3 1U INTL Uninterruptible Power System	AF471A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html
 (Worldwide)

HP R/T3000 G2 Uninterruptible Power System (UPS)

HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System	AF466A
HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System	AF467A
HP R/T3000 G2 2U Detachable Cord High Voltage INTL Uninterruptible Power System	AF468A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/14058_div/14058_div.html
 (Worldwide)

HP Rack-Mountable R5500 UPS

HP R5500 6000VA INTL 3U Rackmount Uninterruptible Power System	AF416A
HP R5500 5000kVA NA/JP 3U Rackmount Uninterruptible Power System	AF426A

NOTE: Please see the QuickSpecs for additional options and configuration information at:
http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html
 (Worldwide)

R5000 Uninterruptible Power System (UPS)

HP R5KVA 3U IEC309-32A High Voltage INTL Uninterruptible Power System	AF461A
HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System	AF460A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/14109_div/14109_div.html
 (Worldwide)

R7000 Uninterruptible Power System (UPS)



Additional Options

HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System	AF462A
HP R7KVA 4U IEC-32A High Voltage INTL Uninterruptible Power System	AF463A

NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/14110_div/14110_div.html
(Worldwide)

NOTE: Additional HP Uninterruptible Power Systems (UPS) are available for this equipment. For information on all HP UPSs and accessories please go to www.hp.com/products/ups (Worldwide)

NOTE: For additional information on sizing your HP UPS, please reference: <http://www.upssizer.com>

NOTE: Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords.

HP Power Distribution Units

HP Monitored Power Distribution Unit: Half Rack Version

HP 4.9kVA 24A Single Input Single Phase NA/JP Monitored Power Distribution Unit	AF914A
HP 7.3kVA 32A Single Input Single Phase INTL Monitored Power Distribution Unit	AF915A

HP Monitored Power Distribution Unit: Full Rack Version

HP 8.6kVA 24A Single Input Three Phase NA/JP Monitored Power Distribution Unit	AF504A
HP 8.3kVA 40A Single Input Single Phase NA/JP Monitored Power Distribution Unit	AF506A
HP 11kVA 16A Single Input Three Phase INTL Monitored Power Distribution Unit	AF508A
HP 7.3kVA 32A Single Input Single Phase INTL Monitored Power Distribution Unit	AF510A

NOTE: Please see the following QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/12118_div/12118_div.html
(Worldwide)

Modular Power Distribution Units 1U/0U (Up to 32 outlets)

NOTE: 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).

HP 4.9kVA 24A High Voltage NA/JP Modular Power Distribution Unit	252663-D72
HP 8.3kVA 40A High Voltage NA/JP Modular Power Distribution Unit	252663-D73
HP 7.3kVA 32A High Voltage INTL Modular Power Distribution Unit	252663-B31
HP 3.6kVA 16A High Voltage INTL Modular Power Distribution Unit	252663-B24

NOTE: This PDU has a detachable input power cord and allows for adaptability to country specific power requirements.

NOTE: Please see the following QuickSpecs for additional options including shorter jumper cables and country specific power cords:

http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.html
(Worldwide)

NOTE: For additional information on HP Power Distribution Units including accessories please go to: www.hp.com/go/pdu.

NOTE: Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords.



Additional Options

HP Intelligent Power Distribution Units (iPDU)	iPDU Core Units	
	HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF520A
	HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF522A
	HP 7.3kVA 32A Single Phase INTL Core Intelligent Modular Power Distribution Unit	AF525A
	HP 11kVA 16A Three Phase INTL Core Intelligent Modular Power Distribution Unit	AF526A
	HP 11.4kVA 16A 415V Three Phase L22-20 NA Core Intelligent Power Distribution Unit	AF900A
	HP 17.3kVA 24A 415V Three Phase L22-30 NA Core Intelligent Power Distribution Unit	AF902A
	HP 17.3kVA 24A 415V Three Phase IEC309 NA Core Intelligent Power Distribution Unit	AF901A
<p>NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13650_div/13650_div.html (Worldwide)</p>		

HP Rack Series	HP Rack 10000 G2 Series (Carbon/Graphite Metallic)	
	HP 10642 G2 Pallet Universal Rack	AF001A
	HP 10642 G2 Shock Universal Rack	AF002A
	HP 10642 G2 1200mm deep Shock Rack	AF092A
	HP 10647 G2 1200mm deep Shock Rack	AF094A
<p>NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.</p> <p>NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html (Worldwide)</p> <p>NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.</p> <p>NOTE: The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.</p> <p>CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment: Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation). Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).</p> <p>CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.</p>		



Additional Options

NOTE: Quick deploy rail system provides tool-free support for racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 G2 and HP series), with an adjustment range of 24" - 36". The ambidextrous cable management arm can be mounted on either the left or right side for improved cable management.

NOTE: For the Ultra Thin Rack Deployment Overview, including best practices for the HP ProLiant DL320 G6, please see the following URL:
www.hp.com/servers/proliantdl320-g6.

HP Rack Options

HP Server Console Switches

HP Server Console 0x2x8 Port Analog Switch AF616A

HP Server Console 0x2x16 Port Analog Switch AF617A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html
(Worldwide)

HP Server Console Switch G2 with Virtual Media & CAC

HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software AF618A

HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software AF619A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html
(Worldwide)

HP IP Console Switch G2 with Virtual Media & CAC

HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software AF620A

HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software AF621A

HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software AF622A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html
(Worldwide)

HP USB and SD Options

HP 4GB Secure Digital High Capacity Flash Media Kit 580387-B21

NOTE: Blank USB and SD media device is supported for use with VMware and Citrix. USB/SD media must be installed in the internal slot of the ProLiant server. Learn more at: <http://www.hp.com/go/proliantvirtualization>.

HP 2GB USB Flash Media Drive Key Kit 608447-B21

NOTE: HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to [HP VMware Getting Started Guide](#) for installation instructions.

HP Internal USB Cable G6 Kit 536769-B21



Additional Options

HP Care Pack Services

Hardware Services On-site Service

HP 3 year Next business day ProLiant DL320 Hardware Support	U4479E
HP 3 year 4 hour 13x5 ProLiant DL320 Hardware Support	U4480E
HP 3 year 4 hour 24x7 ProLiant DL320 Hardware Support	U4481E
HP 3 year 6 hour 24x7 Call to Repair ProLiant DL320 Hardware Support	U4482E

Installation & Start-up Services

HP Install ProLiant DL320 Service	U4490E
HP Startup ProLiant DL320 Service	U4491E

Support Plus 24

HP 3 year Support Plus 24 Microsoft ProLiant DL320 Service	U4493E
HP 3 year Support Plus 24 SuSE ProLiant DL320 Service	U6309E

NOTE: For more information, customer/resellers can contact:

<http://www.hp.com/hps/>



Memory

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

DDR3 memory population guidelines

NOTE: Charts do not represent all possible memory configurations.

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:

www.hp.com/go/ddr3memory-configurator

Some DIMM installation guidelines are summarized below:

- For servers with nine (9) memory slots;
- There are three (3) channels per processor, per server.
- There are three (3) DIMM slots for each memory channel; nine (9) total slots.
- Memory channel 1 consists of the three (3) DIMMs that are closest to the processor.
- Memory channel 3 consists of the three (3) DIMMs that are furthest from the processor.
- DIMM slots that are white should be populated first.
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs).
- To maximize performance, balance the total memory capacity between all installed processors.
- It is not required, but it is recommended to load the channels similarly if possible.
- You can only have up to eight (8) ranks installed per channel.
- You can only install two quad-rank DIMMs per channel.
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty.
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel.
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset.
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically.
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5; 3,6 on a 3DPC system or 1,4; 2,5; on a 2DPC system.
- No mixing DIMM voltage; all DIMMs must be the same voltage.

DDR3 DIMM slot/capacity/populated speed table

DIMM Type ->	Registered (RDIMMs)								Unbuffered with ECC (UDIMMs)	
DIMM Rank ->	Single Rank (1R)	Dual Rank (2R)					Quad Rank (4R)		Single Rank	Dual Rank (2R)
DIMM Capacity ->	4GB	2GB	4GB	8GB	8GB	16GB	4GB	16 GB	1GB	2GB
DIMM Native Speed (MHz) ->	1333	1333	1333	1066	1333	1333	1066	1066	1333	1333
SLOTS THAT CAN BE POPULATED										
9 slot servers	9	9	9	9	9	9	6	6	6	6
MAXIMUM CAPACITY (GB)										
9 slot servers	36	18	36	72	72	144	24	96	6	12
POPULATED DIMM SPEED (MHz)										
1 DIMM Per Channel	1333	1333	1333	1066	1333	1333	1066	1066	1333	1333
2 DIMM Per Channel	1333	1333	1333	1066	1333	1066/ 1333**	800	800	1066	1066
3 DIMM Per Channel	800	800	800	800	800	800***	n/a*	n/a*	n/a*	n/a*



Memory

* - not supported by HP at this time.

**2DPC: LV runs at 1066, Std voltage runs at 1333

***3DPC: LV/Std voltage runs at 800

NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz
- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities.
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor.
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, the maximum speed will be 1066MHz.
- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, at the maximum speed will be 1066MHz.
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz.
- Maximum memory speed will also depend on the processor installed
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

DIMM slot and configuration diagrams

Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

9 DIMM SLOTS		
	CPU1	
	slot #	population order
Chnl 1	1	G
	2	D
	3	A
Chnl 2	4	H
	5	E
	6	B
Chnl 3	7	I
	8	F
	9	C

Standard memory configuration

- 6GB, consisting of three (3) 2GB dual-rank PC3-10600 RDIMMs



Memory

	CPU1	
	slot #	population order
Chnl 1	1	G; empty
	2	D; empty
	3	A; 2GB DIMM
Chnl 2	4	H; empty
	5	E; empty
	6	B; 2GB DIMM
Chnl 3	7	I; empty
	8	F; empty
	9	C; 2GB DIMM

Standard memory plus optional memory

- 54GB, consisting of three (3) 2GB RDIMMs plus six (6) 8GB RDIMMs
- 3x 2GB dual-rank PC3-10600 RDIMMs
- 6x 8GB dual-rank PC3-10600 RDIMMs

	CPU1	
	slot #	population order
Chnl 1	1	G; 8GB DIMM
	2	D; 8GB DIMM
	3	A; 2GB DIMM
Chnl 2	4	H; 8GB DIMM
	5	E; 8GB DIMM
	6	B; 2GB DIMM
Chnl 3	7	I; 8GB DIMM
	8	F; 8GB DIMM
	9	C; 2GB DIMM

Standard memory replaced with optional memory

RDIMM maximum configuration

- 16GB, consisting of six (6) 8GB dual-rank PC3-10600 RDIMMs



Memory

	CPU1	
	slot #	population order
Chnl 1	1	G; empty
	2	D; 16GB DIMM
	3	A; 16GB DIMM
Chnl 2	4	H; empty
	5	E; 16GB DIMM
	6	B; 16GB DIMM
Chnl 3	7	I; empty
	8	F; 16GB DIMM
	9	C; 16GB DIMM

UDIMM maximum configuration (2 UDIMMs per Channel limit)

- 24GB, consisting of six (6) 4GB dual-rank PC3-10600 UDIMMs

	CPU1	
	slot #	
Chnl 1	1	G; empty
	2	D; 2GB DIMM
	3	A; 2GB DIMM
Chnl 2	4	H; empty
	5	E; 2GB DIMM
	6	B; 2GB DIMM
Chnl 3	7	I; empty
	8	F; 2GB DIMM
	9	C; 2GB DIMM

NOTES;

Memory configurations above do not apply to "Factory Integrated Models".
Capacity references are rounded to the common Gigabyte values.

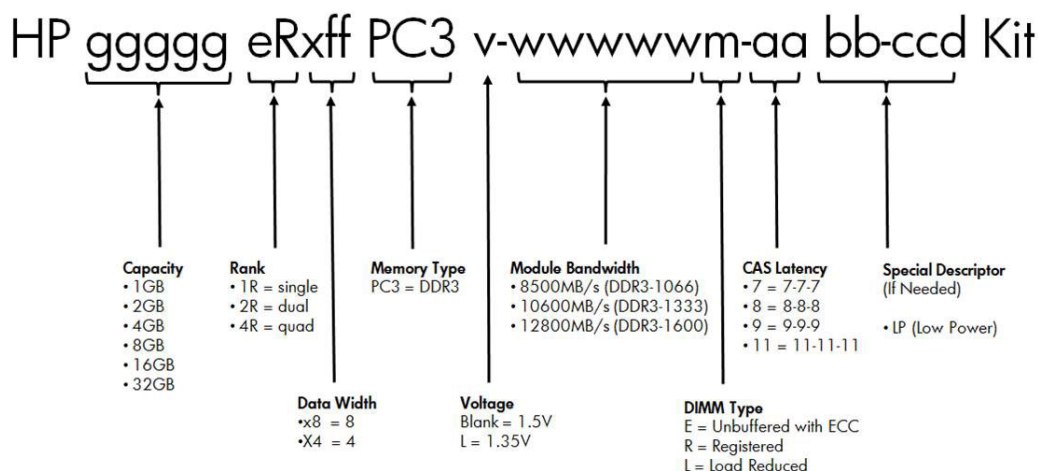
- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:
www.hp.com/go/ddr3memory-configurator

DDR3 memory options part number decoder



Memory



Following are memory options available from HP:

HP Memory

Registered DIMMs (RDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500656-B21

HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500658-B21

HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit 500660-B21

HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 593339-B21

HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604504-B21

NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500662-B21

HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit 500666-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604506-B21

NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit 627812-B21

Unbuffered with ECC DIMMs (UDIMMs)

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500668-B21

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500670-B21

HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500672-B21

HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit 619488-B21



Memory

NOTE: Depending on the memory configuration and processor model the memory speed may run at 1066MHz or 800MHz. See the Online Memory Configuration Tool for details: <http://www.hp.com/go/ddr3memory-configurator>.

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: PC3L is a low voltage memory

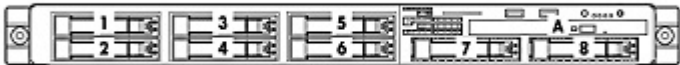


Storage

1-4 Four SATA or SAS drive bays



A Optical Drive Bay: Optional 9.5mm DVD-ROM, or DVD-RW drive



1-8 Eight Hot-plug SATA/SAS hard drive bays

A Optional 9.5mm DVD-ROM, or DVD-RW drive

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
HP 9.5mm SATA DVD-ROM Optical Drive	Up to 1	A	HP embedded SATA Controller
HP 9.5mm SATA DVD RW Optical Drive	Up to 1	A	HP embedded SATA Controller

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
900GB 6G SAS 10K	Up to 8	1-8	HP Smart Array P410/256 MB Controller
600GB 6G SAS 10K			HP Smart Array P410/512 MB with BBWC Controller
450GB 6G SAS 10K			
300GB 6G SAS 10K			
300GB 6G SAS 15K			
146GB 6G SAS 15K			
72GB 6G SAS 15K			

SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives



Storage

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K	Up to 4	1-4	HP Smart Array P212/Zero Memory Controller
450GB 6G SAS 15K			HP Smart Array P212/256 MB Controller
300GB 6G SAS 15K			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 6G SAS 7.2K	Up to 8	1-8	HP Smart Array P410/256 MB Controller
500GB 7.2K SFF			HP Smart Array P410/512 MB with BBWC Controller

SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
3TB 6G SAS 7.2K	Up to 4	1-4	HP Smart Array P212/Zero Memory Controller
2TB 6G SAS 7.2K			HP Smart Array P212/256 MB Controller
1TB 6G SAS 7.2K			HP Smart Array P410/256 MB Controller
1TB 3G SAS 7.2K			HP Smart Array P410/512 MB with BBWC Controller
750GB 3G SAS 7.2K			

SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K	Up to 8	1-8	HP Smart Array P410/256 MB Controller
500GB 3G SATA 7.2K			HP Smart Array P410/512 MB with BBWC Controller

SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
3TB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array B110i SATA RAID Controller with RAID 0/1/1+0 support
2TB 3G SATA 7.2K			HP Smart Array P212/Zero Memory Controller
1TB 3G SATA 7.2K			HP Smart Array P212/256 MB Controller
500GB 3G SATA 7.2K			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives

Quantity Supported	Position Supported	Controller
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Storage

250GB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array B110i SATA RAID Controller with RAID 0/1/1+0 support
160GB 3G SATA 7.2K			HP Smart Array P212/Zero Memory Controller
			HP Smart Array P212/256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

SATA Hot Plug 2.5" Enterprise Mainstream Solid State Drives

NOTE: SSD drives requires SFF drive cage.

	Quantity Supported	Position Supported	Controller
400GB 3.0G SATA	8	1-8	HP Smart Array P410/256 MB Controller
200GB 3.0G SATA			HP Smart Array P410/512 MB with BBWC Controller
120GB 3.0G SATA			
100GB 3.0G SATA			
60GB 3.0G SATA			

SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
400GB 3.0G SATA	4	1-4	HP Smart Array P212/Zero Memory Controller
200GB 3.0G SATA			HP Smart Array P212/256 MB Controller
100GB 3.0G SATA			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

6G SAS Hot Plug Enterprise Performance Solid State Drives

	Quantity Supported	Position Supported	Controller
200GB 6G SAS SLC SFF	Up to 8	1-8	HP Smart Array P212/Zero Memory Controller
400GB 6G SAS SLC SFF			HP Smart Array P212/256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

6G SAS Hot Plug Enterprise Mainstream Solid State Drives

	Quantity Supported	Position Supported	Controller
800GB 6G SAS MLC SFF	Up to 8	1-8	HP Smart Array P212/Zero Memory Controller
400GB 6G SAS MLC SFF			HP Smart Array P212/256 MB Controller
200GB 6G SAS MLC SFF			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller



Storage

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
D2600 Disk Enclosure	Up to 4	External	HP Smart Array P212/256 MB Controller
	Up to 8		HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller
D2700 Disk Enclosure	Up to 2	External	HP Smart Array P212/256 MB Controller
	Up to 4		HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

Maximum Storage Capacity – (SAS drives)

Internal	12TB (4 x 3TB SAS)
External	128TB (1 x (16x8 x 1TB SAS))
Total	140TB

NOTE: In order to implement integrated SATA RAID with Smart Start 8.20 on Windows 2003, the use of a floppy drive is necessary.

Maximum Storage Capacity – (SATA Drives)

Internal	12TB (4 x 3TB SATA)
External	128TB (1 x (16+8) x 1TB SATA))
Total	140TB

Tape and Disk Backup

NOTE: For the complete range of tape drives, autoloaders, libraries and media, including the internal fitting models, see: <http://www.hp.com/go/tape>. For the complete range of D2D Backup Systems see: <http://www.hp.com/go/d2d>. For the complete range of RDX drives and media see: <http://www.hp.com/go/rdx>. For hardware and software compatibility of HP disk and tape backup products see: <http://www.hp.com/go/connect>.

	Position Supported	Controller	Controller Part Number
HP SCSI Tape Drives	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
LTO-1 Ultrium 232			
LTO-2 Ultrium 448			
LTO-3 Ultrium 920			
LTO-3 Ultrium 960			
LTO4 Ultrium 1760			
LTO-4 Ultrium 1840			
DAT 40			
DAT 72			
DAT 160			
1U Rack-Mount Kit			
3U Rack-Mount Kit			

NOTE: Please check the full compatibility information at: <http://www.hp.com/go/connect>



Storage

HP USB Tape Drives DAT 40 DAT 72 DAT 160 DAT 320 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP SAS Tape Drives DAT 160 DAT 320 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 LTO-5 Ultrium 3000 LTO-5 Ultrium 3280 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller NOTE: Please check the full compatibility information at: http://www.hp.com/go/connect	462828-B21
HP SCSI Tape Autoloaders DAT 72x10 Autoloader 1/8 G2 Autoloader	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter NOTE: Please check the full compatibility information at: http://www.hp.com/go/connect	412911-B21
HP SCSI Tape Libraries, External MSL2024 MSL4048 MSL8096 MSL6000	External	HP U320e SCSI Dual Channel Host Bus Adapter NOTE: Please check the full compatibility information at: http://www.hp.com/go/connect	AH627A
HP SAS Tape Autoloaders and Libraries 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller NOTE: Please check the full compatibility information at: http://www.hp.com/go/connect	462828-B21
HP Fibre Channel Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for connectivity information and the supported Fibre Channel HBAs shown in this QuickSpecs.	N/A
HP USB RDX Removable Disk Backup System	External	USB 2.0 Port	N/A



Storage

RDX160
RDX320
RDX500
RDX750
RDX1TB

HP D2D Backup Systems, iSCSI D2D2500i D2D4000i	External	Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	N/A
HP D2D Backup Systems, Fibre Channel D2D4000fc	External	Direct server attach is not supported, requires connection via SAN fabric. See: http://www.hp.com/go/connect	N/A

Power Specifications

HP 500W Factory Integrated Power Supply Kit with Backplane							
Part Number	537150-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	47/63						
Nominal Input Voltage (Vrms)	100	120	200	220	230	240	
Maximum Rated Output Wattage	500	500	500	500	500	500	
Nominal Input Current (A rms)	5.74	4.99	2.86	2.58	2.46	2.36	
Max Rated Input Wattage Rating (Watts)	568	568	562	556	556	556	
Max. Rated VA (Volt-Amp)	574	574	573	567	567	567	
Efficiency (%) at Max. Rated Output Wattage	88	88	89	90	90	90	
Power Factor	0.99	0.99	0.98	0.98	0.98	0.98	
Leakage Current (mA)	0.42	0.50	0.81	0.91	0.95	1.00	
Max. Inrush Current (A peak)	30						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)							

HP 460W Common Slot Gold Hot Plug Power Supply Kit							
Part Number	503296-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	460	460	460	460	460	460	460
Nominal Input Current (A rms)	5.5	4.5	2.6	2.5	2.4	2.3	2.2
Maximum Rated Input Wattage Rating (Watts)	526	520	505	505	503	503	503
Maximum Rated VA (Volt-Amp)	548	542	527	527	524	524	524
Efficiency (%)	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1794	1773	1725	1725	1715	1715	1715



Power Specifications

HP 400W Factory Integrated Power Supply Kit							
Part Number	515739-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage	400	400	400	400	400	400	400
Nominal Input Current (A rms)	5.5	5.0	2.5	2.4	2.3	2.2	2.1
Max Rated Input Wattage Rating (Watts)	510	500	480	480	480	480	480
Max. Rated VA (Volt-Amp)	520	520	500	500	500	500	500
Efficiency (%) at Max. Rated Output Wattage	83.0	84.0	86.0	86.0	87.0	87.0	87.0
Power Factor	0.97						
Leakage Current (mA)	0.75	0.75	0.85	0.90	0.95	0.95	1.00
Max. Inrush Current (A peak)	35						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1739	1705	1636	1636	1636	1636	1636

HP 365W Hot Plug Redundant Power Supply Kit with Backplane							
Part Number	532092-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage	320	320	360	360	360	360	360
Nominal Input Current (A rms)	4.15	3.41	2.23	2.16	2.03	1.94	1.86
Max Rated Input Wattage Rating (Watts)	412	406	445	445	444	443	443
Max. Rated VA (Volt-Amp)	413	407	447	447	446	446	445
Efficiency (%) at Max. Rated Output Wattage	77.4	78.5	80.5	80.6	80.7	80.8	81
Power Factor	0.99						
Leakage Current (mA)	0.75	0.75	0.85	0.90	0.95	0.95	1.00
Max. Inrush Current (A peak)	35						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1354	1334	1462	1462	1459	1456	1456

NOTE: To review typical system power ratings use the Active Answers Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor.



Technical Specifications

System Unit	Dimensions (H x W x D) (with bezel)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.19 cm)	
	Weight (approximate)	Maximum (four hard drives, power supply, and processor installed)	29.95 lb (13.6kg)
		Minimum (one hard drive, power supply, and processor installed)	25.52lb (11.6kg)
	Input Requirements (per power supply)	Range Line Voltage	90 - 132 VAC, 180 - 264 VAC
		Rated Input Current	6 A (at 100 VAC), 3 A (at 200 VAC)
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	486 W (at 100 VAC), 479 W (at 200 VAC)
	BTU Rating	Maximum	1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)
	Power Specifications	NOTE: To review typical system power ratings use the HP Power Advisor which is available online located at url: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor	
		<ul style="list-style-type: none">- Click on the system of interest. Example: DL320 G6- Follow the instructions of the next screens.	
Power Supply Output (per power supply)	Rated Steady-State Power	400 W (at 100 VAC), 400 W (at 200 VAC)	
	Maximum Peak Power	400 W (at 100 VAC), 400 W (at 200 VAC)	
System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).	
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).	
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
Non-operating		5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.	



Technical Specifications

Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
	Idle	
	LWAd	6.25 B
	LpAm	51.4dBA
	Operating	
	LWAd	6.25 B
Emissions Classification (EMC)	LpAm	51.4 dBA
	FCC Rating	Class A
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Power Supply	Input voltage specifications	Rated input voltage	100 VAC to 240 VAC
	Input Specifications	Rated input line	90 VAC to 264VAC
		Frequency range	47 to 63 Hz
		Rated input power	@ 115V input, Rated input power = 486W (assume output wattage=450W) @ 230V input, Rated input power = 479W (assume output wattage=450W)
		Rated input current	6 A, 3 A (110 V, 220 V)
	BTU Rating	Steady state power	420W (rated)
			1710 BTU/hr
	Ambient temperature range	Operating	50° to 118° F (10° to 48° C)
		Non-operating	-40° to 158° F (-40° to 70° C)
	Relative humidity (non-condensing)	Operating	55% to 85%
		Non-operating	5% to 95%
	Dielectric voltage withstand	Input to output	1800 VAC/minute
		Input to ground	1800 VAC/minute



Technical Specifications

Maximum Wet Bulb Temperature	106.3° F (41.3° C)
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Integrated Serial ATA Controller	Simultaneous drive transfer channels	4 channels
	Transfer rate synchronous (maximum theoretical)	150 MB/s per channel
	Data transfer method	HP Smart Array B110i SATA RAID Controller (non-RAID mode) HP Smart Array B110i SATA RAID Controller (RAID Mode)
	Drive support	Serial ATA
	Data transfer modes	Legacy Mode Combined Mode
	Protocol	Serial ATA
	Feature	NCQ (Native Command Queuing); AHCI (Advanced Host Controller Interface)
	RAID levels supported	0, 1, 1+0
	RAID Features	Supports multiple logical volumes Setup through ROM based Array Configuration Utility Installation scripting support NOTE: This controller does not support Hot Plug functions or LED functions.
	RAID OS Support	Microsoft Windows Server 2003/2008 NOTE: In order to implement integrated SATA RAID with Smart Start 8.20 on Windows 2003/2008, the use of a floppy drive is necessary. Linux (Red Hat, SuSE, UnitedLinux)

Embedded NC326i Dual Port Gigabit Server Adapter	Network Interface	10Base-T/ 100Base-TX/ 1000Base-TX
	Compatibility	IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3u 100Base-TX
	Data Transfer Method	Four lane (x4), 100MHz PCI Express Reference Clock
	Controller	BCM5715
	Network Transfer Rate	10Base-T (Half-Duplex) 10 Mb/s
		10Base-T (Full-Duplex) 20 Mb/s
		100Base-TX (Half-Duplex) 100 Mb/s
		100Base-TX (Full-Duplex) 200 Mb/s
		1000Base-TX (Half and Full-Duplex) 2000 Mb/s
	Connector	RJ-45
	Cable Support	10Base-T Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX Category 5 UTP; up to 328 ft (100 m)



Technical Specifications

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: <http://www.hp.com/go/green>. To recycle your product, please go to: <http://www.hp.com/go/green> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.

